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[Translation of "Patentansprüche1.pdf"]

Claims

1. Hydraulic steering device for vehicles, in particular construction machines, in which they possesses a hydraulic swivelling motor (2) for producing the steering movement, which is connected with a pump (3) with variable flow rate and reversible direction of delivery, characterised in that the swivelling motor (2) is designed as the articulation (21) of an articulated vehicle (22) or is arranged on an articulation joint (21).
2. Steering device in accordance with claim 1, **characterised in that** the variable flow pump (3) with reversal of its delivery direction is designed as a constant displacement pump, which is drivable by a controlled variable speed electric motor.
3. Steering device in accordance with claim 1, **characterised in that** the variable flow pump (3) with reversal of its delivery direction is designed as a variable displacement volume pump (3) with reversal of its delivery direction, in particular as a variable displacement axial piston pump with a swashplate.
4. Steering device in accordance with claim 4, **characterised in that** at least one swivelling motor (2) is arranged above and/or beneath the articulation joint (21).
5. Steering device in accordance with one of the preceding claims, **characterised in that** the swivelling motor (2) is designed as a swivelling vane motor.

- 6 Steering device in accordance with claim 1 or one of the preceding claims,
 characterised in that
 for controlling the pump an electronic controller (38), in particular a micro controller is
 envisaged.
- 7 Steering device in accordance with one of the preceding claims
 characterised in that
 sensors (29) for recording the steering angle and/or further system state parameters of state are
 envisaged.
- 8 Steering device in accordance with one of the preceding claims
 characterised in that
 for setting the steering angle an electronic control element, in particular a joystick, possibly with
 a force-feedback function is envisaged.
- 9 Steering device in accordance with claim 1 or one of the preceding claims,
 characterised in that
 as the steering motor a known linear cylinder system is envisaged.
- 10 Steering device in accordance with claim 1 or one of the preceding claims,
 characterised in that
 as the steering motor a swivelling motor with hydraulically driven pinion running over a toothed
 rack is envisaged.
- 11 A process for controlling a steering device, especially in accordance with one of the preceding
 claims,
 characterised in that
 a set angle prescribed by the operator (36) is recorded, and depending upon that the quantity
 and direction of the volume flow to the hydraulic steering motor is influenced.

- 12 A process for controlling a steering device in accordance with claim 8
characterised in that

additionally the actual angle of the steering device is recorded and the volume flow to the steering motor is controlled by a variable control algorithm which is possibly variable depending upon the operating state of the vehicle, in particular a steering angle control and/or a steering angle velocity controller.

Claims

1. Hydraulic steering device for vehicles, especially construction machines,
characterised in that
it possess a hydraulic swivelling motor (2) for producing the steering movement, which is connected to a variable flow pump (3) with reversal of the delivery direction.
2. Steering device in accordance with claim 1, **characterised in that**
the variable flow pump (3) with reversal of its delivery direction is designed as a constant displacement pump, which is drivable by a controlled variable speed electric motor.
3. Steering device in accordance with claim 1, **characterised in that**
the variable flow pump (3) with reversal of its delivery direction is designed as a variable displacement volume pump with reversal of its delivery direction, in particular as a variable displacement axial piston pump with a swashplate.
4. Steering device in accordance with claims 1 to 3, **characterised in that**
the swivelling motor (2) is designed as the articulation of a vehicle (22) with a centre-pivot or is arranged in and/or on an articulation joint (21).
5. Steering device in accordance with claim 4, **characterised in that**
at least one swivelling motor (2) is arranged above and/or beneath the articulation joint (21).
6. Steering device in accordance with one of the preceding claims,
characterised in that the swivelling motor (2) is designed as a swivelling vane motor.

7. Steering device in accordance with claim 1 or one of the preceding claims,
characterised in that
for controlling the pump an electronic controller (38), in particular a micro controller is envisaged.
8. Steering device in accordance with one of the preceding claims
characterised in that
sensors (29) for recording the steering angle and/or further system state parameters of state are envisaged.
9. Steering device in accordance with one of the preceding claims
characterised in that
for setting the steering angle an electronic control element, in particular a joystick, possibly with a force-feedback function is envisaged.
10. Steering device in accordance with claim 1 or one of the preceding claims,
characterised in that
as the steering motor a known linear cylinder system is envisaged.
11. Steering device in accordance with claims 1 to 9,
characterised in that
as the steering motor a swivelling motor with hydraulically driven pinion running over a toothed rack is envisaged.
12. A process for controlling a steering device, especially in accordance with one of the preceding claims,
characterised in that
a set angle prescribed by the operator (36) is recorded, and depending upon that the quantity and direction of the volume flow to the hydraulic steering motor is influenced.

13 A process for controlling a steering device in accordance with claim 9

characterised in that

additionally the actual angle of the steering device is recorded and the volume flow to the steering motor is controlled by a control algorithm which is possibly variable depending upon the operating state of the vehicle, in particular a steering angle control and/or a steering angle velocity controller.